CASE OF SYPHILOMA OF THE CORD OF THE CAUDA EQUINA—DEATH FROM DIFFUSE CENTRAL MYELITIS.

By WILLIAM OSLER, M. D.

Professor of Medicine, Johns Hopkins University, Baltimore.

THE following case which was under the care of Dr. S. Weir Mitchell, at the Infirmary for Nervous Diseases, Philadelphia, presents many points of clinical and anatomical interest.

Clinical Summary.—Chronic alcholism, history of syphilis. For nine months pains in the legs, particularly in the left, which wasted rapidly, and presented vaso-motor changes. Pains in the arms, especially the right ; no wasting, and, on admission arms of equal strength. About two months before death loss of control of bladder and rectum. Within the last month of life loss of power in the right arm, with pains ; partial loss of power in the left arm with marked inco-ordination, complete paralysis of the left leg, gradual loss of power in the right. Development of bed sores. Arthritis in knees and ankles. Towards the close of life, high fever with delirium.

Anatomical Summary.—Gumma in antero-lateral columns of cervical cord opposite the right fourth anterior nerve root. Gummata involving the third, fourth and fifth anterior sacral nerve roots, and the second and third posterior sacral roots on the left side. Ascending degeneration of the left posterior median column. Central myelitis. Partial atrophy of the sciatic nerves.

A. B., æt. 42, lawyer, admitted February 5, 1888. Family history good. Had been a hard drinker for years and had smoked and chewed to excess. He had gonorrhœa four times, and a soft chancre but no history of secondaries could be obtained.

In 1876 he had delirium tremens.

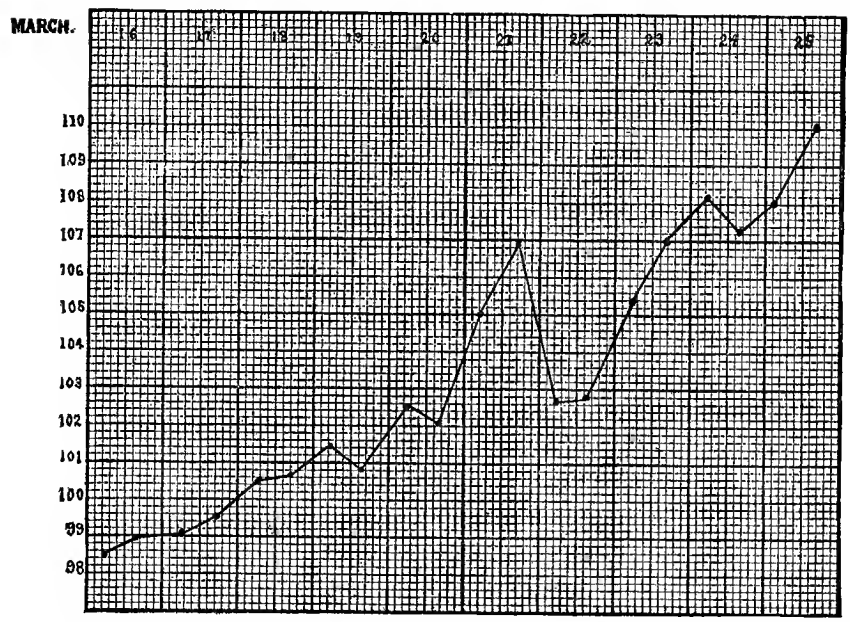
About April, 1887, he began to have sharp, shooting pains in the arms and legs. They came on suddenly, were stab-like in character, lasting only a moment and then passing off. No definite regions in the arms and legs were involved. He also had dull pains in the back of the head and neck. These troubled him more or less throughout the summer, but he could get about fairly well. Towards the second week in October the pains began to be more severe in the left leg ; they were thought to be rheumatic in character. About the twenty-fourth of October, his suffering was so great that he was confined to bed. By November 5th he could scarcely walk. The pain began in the right arm and shoulder, the right leg also was painful and weak. There was no redness or swelling of the knees, but the left foot and ankle would get red and swollen, almost purple. The left leg wasted rapidly and for a time he lost sensation in the legs completely. The left arm remained unaffected. About a month before his admission he lost control of his bowels and had a constant desire to urinate. He had to use the catheter for several weeks.

The following notes of his condition were taken on admission by Dr. Burr, Resident Physician.

" He can stand a little with the aid of a chair and he can flex and extend the right knee and hip. He cannot move the left leg, the knee of which is swollen. He has very little pain, none in the right leg. The wasting of the left leg is marked. The knee-jerk is present on the right side but on the left side it is obtained with difficulty. On the right side cremasteric reflex is present, absent on the left. Abdominal reflex present on both sides. No tender spots over spine; bed sores on the coccyx and on the left buttock ; has pain in the shin bones and in the groin at night. The arms show almost equal strength. The dynamometer registers 115 for the right hand and 120 for the left.

For two weeks he seemed to be in much the same state though in rather less pain. Towards the end of the month the ankles and knees became more swollen ; the bed sores had healed.

On March 16th, the note is as follows: "Has been unable to move the right knee or thigh since yesterday; the swelling has subsided in the knee but the ankle remains swollen; the fingers of the left hand have been numb since yesterday; pain along the inner side of both arms and at the points of the elbow; pain in the left shoulder for several days; right hand is powerless; fingers held flexed in palm; can move the right shoulder; is losing power in the left arm



and hand; movements are distinctly ataxic; there is pain on spine over the seventh cervical vertebræ, worse on pressure."

From the 17th to the 20th the temperature rose gradually, reaching 102°, and at this date he lost sensation in the ulnar distribution of both hands.

21st.—Delirious, but can be easily roused, when he will talk rationally for a few minutes; tongue red, dry and coated; pupils contracted; pulse rapid and feeble; gangrenous bullæ on the outer side of heel; temperature rose this morning to 105° and remained high all the morning. At 2 P. M. it reached 106.8°. Cold sponging and antipyrin reduced it to 102° by evening.

22d.—The delirium persists and bed sores have again appeared on the sacrum; the scrotum is œdematous; he has difficulty in swallowing; the breathing is diaphragmatic; does not complain of pain; temperature, to-day remained below 104°.

23d.—General condition unchanged; is unconscious and is roused with difficulty; morning temperature was 102° rising gradually during the afternoon till it reached 105.6° at 7 P. M.; at 10 P. M., it was 106.8°

24th —Low, delirious fever continues, reaching at 12 M. 107° and continued elevated during the afternoon. At 10 P. M., the rectal temperature was 108°; at 12:30 A. M., 108.4°; at 2 A. M., 108.8°; at 3 A. M., 109.4°. See chart.

Death occurred at 4 A. M.

Post-mortem, five hours after death.

Body emaciated, left leg smaller than the right; scrotum œdematous; superficial gangrenous bullæ on each heel; recent bed sores on sacrum.

The skull cap was removed with difficulty, as there were strong adhesions to dura.

Logitudinal sinus contains blood. Parts at the base of skull normal; cortical arachnoid, opaque. Pachiionian granulations abundant and large; pia mater turbid, strips off readily from hemisphere, but is somewhat œdematous. Convolutions look healthy, and the gray matter is of a rosy pink color; white substance moist, with very few bleeding points; lateral ventricles look dry; third and fourth ventricles present no changes; in the latter, the vessels just above the acoustic striæ are a little congested.

Section of the ganglia at the base show no foci of disease; pons and medulla symmetrical; no descending lesions.

Cerebellum normal.

Spinal Cord.—Dura mater natural looking, nowhere adherent except at the anterior part of cervical enlargement; no sub-dural exudation; arachnoid thin and clear. On the right half of the cervical enlargement the dura is attached to the arachnoid and to the pia over an area the size of a split pea. There is here a firm solid mass in the cord, not producing any special deformity, but appearing extern-

ally as a grayish region, situated between the anterior roots of the third, fourth, and fifth cervical nerves. The fourth is involved in the adhesion of the dura. The anterior roots are not involved, nor does the adhesion of the dura extend laterally beneath the dentated ligament. The grayish translucent appearance of the mass extends for about a line beyond the posterior median fissure. Vertically it is about one-third of an inch in length.

Fresh sections were made at the following points:

Second Cervical.—Interior soft, but outlines of gray matter distinct. The left column of Goll has a grayish-white translucency.

Sixth Cervical.—Gray matter has lost its firm appearance, and is very soft and reddish in color.

Seventh Cervical.—Central softening still apparent. Cornua not distinguishable.

Second Dorsal.—Gray matter more natural looking.

Eleventh Dorsal.—Outline of gray matter quite distinct. There is a marked degeneration of the left postero-median fasciculus.

The cauda equina presents the following alterations: The three last anterior nerve roots leaving the conus medullaris are involved in a gummous growth the size of a bean, into which pass also the posterior roots of the second and third sacral nerves of the left side. They are involved about two inches from the cord. Lower in the canal there are two or three small fibres, which present slight tuberous enlargements.

The tumor of the cord varies in transverse diameter from three-eighths to one-quarter of an inch in diameter; it is completely within the cord, the symmetry of which is not materially altered (Fig. 1). In shape, above and below, it is rounded; in the middle, more ovoid. The vertical extent is not quite half an inch. At a limited region the dura is adherent to the pia, which membrane, at this point, is distinctly thickened. With a low power it is seen that the growth occupies the right antero-lateral region, destroying and pushing aside the anterior cornu, displacing the antero-median fissure and pushing back the posterior

cornu. In the upper part of the growth, the outlines of the gray matter of the left side and of the right posterior horn are well seen. In the middle portion they are much less distinct; and here the growth reaches so far over that it is only one-eighth of an inch from the left lateral margin of the cord. The growth is firm, not encapsulated, and sections in carmine stain of a deep red color. The greater portion of the mass is made up of a dense fibro-caseous tissue, devoid of cell-elements, and through which passes a

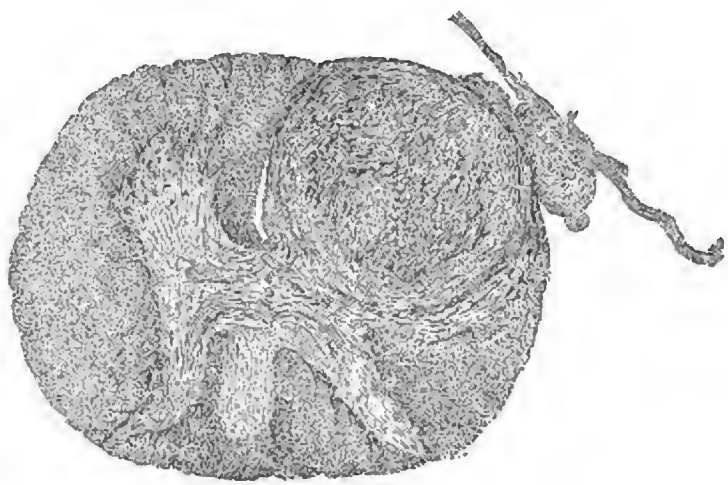


Fig. 1.—Gumma of cervical cord opposite fourth nerve root.

number of blood-vessels, some of which are obliterated, some free. At the periphery, there is marked cell proliferation, particularly towards the gray matter. This is also very distinct in the anterior median fissure. The anterior spinal artery is involved at the edge of the growth, and the adventitia encircled in three-fourths of its extent. The intima is greatly thickened, and the cell elements look much swollen. In the adherent dura, which is not thickened, there are amyloid bodies. The gray matter looks swollen; at the upper portion of the tumor area, the large cells are distinct, but the nuclei do not stain well in carmine. In the middle and lower portions of the affected

regions, the nerve cells are much less distinct, and there is extensive infiltration with leucocytes, particularly in the neighborhood of the vessels.

In the white matter the axis cylinders everywhere stain in the carmine, but the neuroglia looks swollen, and has very indistinct outlines.

The cervical cord, above the gumma, stains well in both carmine and by Wiegert method. The gray matter is distinct, and the nerve cells look somewhat swollen; their nuclei stain well.

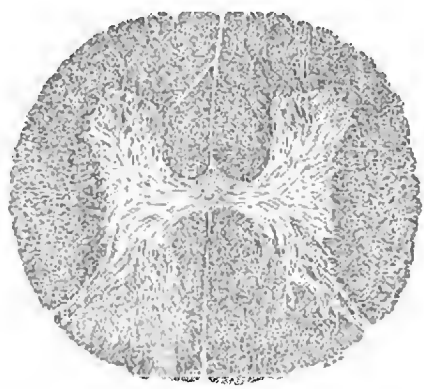


Fig. 2.—Lumbar cord, showing degeneration of the left posterior column.

The tumor of the cauda has matted the nerve roots together, and sections in hæmatoxylin and eosin show large areas of indifferent tissue stained red, surrounded by zones of actively poliferating connective tissue, the cells of which stain deeply in the hæmatoxylin. In the central caseo-fibrous regions the outlines of the nerve bundles can be seen, and, in places, numerous irregular areas, lighter in color, closely set together, which represent the degenerating nerve fibre with their medullary sheaths pale, and many of the axis cylinders stained.

The degeneration of the left posterior column is interesting. In the lumbar cord it involves a wide area, chiefly in the root zone, not reaching the median surface or the posterior, except close to the nerve root (Fig. 2). In the dorsal cord (Fig. 3) the root zone is not involved, and the whole column of Goll is affected except a narrow wedge.

In the region of the tumor the degeneration does not reach so close to the posterior margin (Fig. 1).

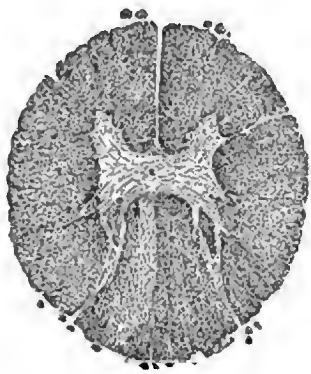


Fig. 3.—Dorsal cord. Descending degeneration of left columns of Goll.

The left sciatic is extensively degenerated. In the right there are two or three bundles in which atrophy is apparent. By Weigert's method the contrast is very striking, as shown in Figs. 4 and 5.

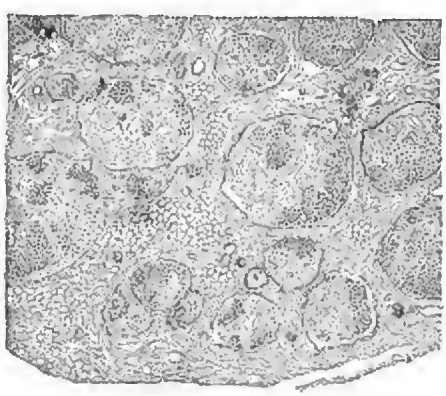


Fig. 4.—Left sciatic nerve. Cross section.

The early pains, at first in the arms and legs, then chiefly in the right arm; the wasting, weakness, and gradually total paralysis of the left leg; the slow onset of the paralysis of the right arm with paresis of the left, find their explanation in the progressive growth of the tumor in the cervical cord. The involvement of the anterior sacral roots was responsible in part for the loss of power in the legs,

but the early affection of the left with rapid wasting was undoubtedly the result of the cord lesion.

The accurate localization of the lesions in the cauda equina makes a consideration of the symptoms produced by them of some importance. Unfortunately, there is no note upon sensation in the perineal and gluteal regions, but for two months previous to death there was loss of control of the bladder and rectum. We can, I think, look upon this case as confirming the view that the ano-vesical centres are in the

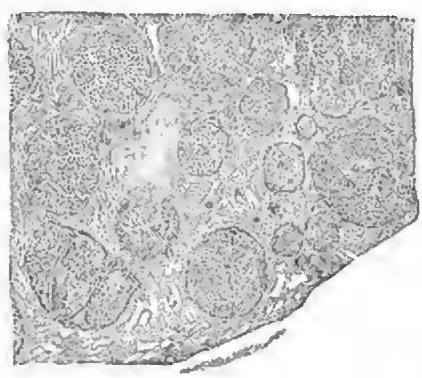


Fig. 5.—Portion of cross section of right sciatic nerve.

sacral, not in the lumbar segments of the cord. The disturbance in the reflex arc was here chiefly in the efferent branches involved in the third, fourth and fifth cords. It will be remembered that of the afferent branches only the second and third sacral roots were involved.

A third point of interest is the ascending degeneration in the left column of Goll due to the lesion in the second and third posterior sacral roots, and, in part also, undoubtedly, to extensive disease of the left sciatic nerve. As is shown in the figures, the distribution of the sclerosis presented the well-known variations in passing from the lumbar to the cervical cord.

Lastly, the case offers an excellent illustration of the chief symptoms of acute cental myelitis, particularly in the high temperature, the arthritic disturbances and the marked trophic changes, as shown in the rapid development of bed sores.